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EXAMINER

PARTHASARATHY, PRAMILA

ART UNIT	PAPER NUMBER
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2136

DATE MAILED: 03/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/670,424

Applicant(s)

SATO ET AL.

Examiner

Pramila Parthasarathy

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30 - 42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 30 - 42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to request for consideration filed on December 02, 2004. Original application contained Claims 1 – 29. Claims 1 – 29 were cancelled. New Claims 30 – 42 were added. Therefore, presently pending claims are 30 – 42.

Response to Arguments

2. Applicant's arguments with respect to new claims 30 – 42 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 30 – 42 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

4. The independent and new Claims 30 and 40 read, "...item title memorizing unit", independent and new Claims 30, 33, 34, 37, 39, 40, 41 and 42 read "item title", Claims 30, 34, 40 and 42 read, "... a key data/specification memorizing unit ...", and Claims 30, 40, 41 and 42 read, "... memorizing keys/item titles ...".

5. With respect to "item title" and "an item title memorizing unit", although the specification discloses and interchangeably uses "item data" and "data item", the specification does not disclose "an item title memorizing unit". The specification does not indicate how the item title used, for example, with respect to column key. Applicant amendment does not clarify and Applicant remarks/arguments do not address "an item title memorizing unit".

6. With respect to "... memorizing unit ...", the specification does not indicate how to perform the step of memorizing and/or memorizing unit for memorizing keys or for memorizing item titles. Applicant remarks/arguments do not address "memorizing unit".

7. With respect to "... memorizing ...", the specification does not indicate how to perform the step of memorizing and/or memorizing unit for memorizing keys and the specification does not indicate how the item title used, for example, with respect to column key. Memorizing keys or titles are not addressed in Applicant remarks/arguments or in the specification.

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8. The dependent claims 31, 32, 35, 36 and 38 are rejected at least by virtue of their dependency on the dependent claims.

9. For the examination purposes, "item title" will be broadly interpreted as either an column or row data from the target segment, "memorizing unit" will be broadly interpreted as memory and "memorizing" will be broadly interpreted as storing.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 30 –42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goldstein (U.S. Patent Number 5,963,642, hereafter "Goldstein") in view of Taguchi et al. (U.S. Patent Number 5,915,025 hereafter "Taguchi").

11. Regarding Claim 30, Goldstein teaches and describes a database management apparatus comprising:

a database storage unit which stores a database comprising a plurality of records each record including a plurality of data segments identified by respective item titles (Goldstein Fig. 5, 6A&B; Column 10 lines 28 – 50 and Column 12 lines 38 – 58);

an item title memorizing unit for memorizing at least one item title for specifying a corresponding at least one data segment group as a target of a data search process (Goldstein Column 12 line 64 – Column 13 line 3);

a key data memorizing unit for memorizing keys for use in encryption associated with the database, wherein the keys comprise a column key corresponding to the at least one data segment group specified by the at least one memorized item title, and a plurality of different row keys corresponding respectively to the records of the database (Goldstein Column 11 line 63 – Column 12 line 9 and Column 14 line 53 – Column 15 line 14); and

an encryption unit for encrypting: (i) the data segments of said at least one specified data segment group using the corresponding column key, and (ii) data segments of at least one data segment group corresponding to item titles other than the memorized item titles, in units corresponding to the records, using the different row keys of the respective records (Goldstein Column 25 line 36 – Column 26 line 22).

12. Even though Goldstein discloses encrypting the data segment using a column key, Goldstein does not explicitly discloses encrypting the data segment group corresponding to item titles other than the memorized item titles, in units corresponding to the records, using the different row keys of the respective records. However, Taguchi

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discloses a data processing apparatus with software protecting functions capable of enhancing the level of encryption security wherein an encryption unit for encrypting the data segments of at least one data segment group corresponding to item titles other than the memorized item titles, in units corresponding to the records, using the different row keys of the respective records (Taguchi Column 3 line 64 – Column 4 line 15; Column 7 lines 40 – 65 and Column 11 lines 3 – 45).

13. Motivation to combine the invention of Goldstein and Taguchi comes from the need for encrypting data by using the column and row keys in a database to provide internal-level encrypted data for faster retrieval and for database information to be locally decrypted. Goldstein provides a discussion for the need for plurality of column keys to encrypt the data by using plurality of column permutations but silent on using plurality of row permutations (Goldstein Column 17 line 53 – Column 18 line 31 and Column 24 and line 34 – column 26 line 29; especially Column 26 lines 5 – 22). It would be obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings of Taguchi which discloses encrypting the data segment using the different row keys of the respective records with the teachings of Goldstein where encrypting the data segment using a column key to provide a database with internal-level data encryption and the encryption keys to depend on the attributes of the row and column keys.

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14. Regarding Claim 33, Goldstein teaches and describes a database system comprising a first information processor terminal storing a database, and a second information processor terminal which is connected to the first information processor terminal via a network and which is adapted to send a request to the first information processor terminal for conducting a search process in the database (Goldstein Fig. 5, 6A&B; Column 10 lines 28 – 50 and Column 12 line 64 – Column 13 line 3), wherein the first information processor terminal comprises:

a functional unit which encrypts: data segments forming data segment groups corresponding to column item titles of a first kind using a column key common to the data segment groups and, data segments forming data segment groups corresponding to column item titles of a second kind, in units of rows of data segments, using respective row keys (Goldstein Column 25 lines 36 – Column 26 line 22);

wherein the second information processor terminal comprises:

a transmitting unit which transfers via the network, an encrypted data set representing conditions to be used for the search process in the first information processor terminal, when the second information processor terminal requests the first information processor terminal to perform the search process on the database, said encrypted data set being formed by encrypting an input data set specifying the conditions of the search process by using the column key (Goldstein Fig. 6A&B, 10A&B; Column 14 lines 24 – 52 and Column 15 lines 22 – 31); and

wherein the first information processor terminal further comprises :

a search performing unit that performs the search process on the encrypted database, based on the transmitted encrypted data set; and a returning unit that returns an encrypted result data set resulting from the search process, to the second information processing terminal via the network (Goldstein Column 14 lines 24 – 52 and Column 15 lines 1 – 4).

15. Even though Goldstein discloses encrypting the data segment using a column key, Goldstein does not explicitly disclose encrypting the data segments forming data segment groups corresponding to column item titles of a second kind, in units of rows of data segments, using respective row keys. However, Taguchi discloses a data processing apparatus with software protecting functions capable of enhancing the level of encryption security wherein an encryption unit for encrypting the data segments of at least one data segment forming data segment groups corresponding to column item titles of a second kind, in units of rows of data segments, using respective row keys (Taguchi Column 3 line 64 – Column 4 line 15; Column 7 lines 40 – 65 and Column 11 lines 3 – 45).

16. Motivation to combine the invention of Goldstein and Taguchi comes from the need for encrypting data by using the column and row keys in a database to provide internal-level encrypted data for faster retrieval and for database information to be locally decrypted. Goldstein provides a discussion for the need for plurality of column keys to encrypt the data by using plurality of column permutations but silent on using

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plurality of row permutations (Goldstein Column 17 line 53 – Column 18 line 31 and Column 24 and line 34 – column 26 line 29; especially Column 26 lines 5 – 22). It would be obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings of Taguchi which discloses encrypting the data segment using the different row keys of the respective records with the teachings of Goldstein where encrypting the data segment using a column key to provide a database with internal-level data encryption using both permutations of column and row keys as the encryption keys to depend on the attributes of the row and column keys.

17. Regarding Claim 34, Goldstein teaches and describes a database management apparatus comprising:

a key specification memorizing unit that memorizes data specifying a type of encryption system to be used to encrypt data segments of each column of a database, if the column of the database is to be encrypted (Goldstein Column 11 line 63 – Column 12 line 9 and Column 14 line 53 – Column 15 line 14);

a first encryption unit that encrypts in accordance with the data memorized by the key specification memorizing unit: (i) data segments forming data segment groups corresponding to column item titles of a first kind using a same column key, and (ii) data segments forming data segment groups corresponding to column item titles of a second kind, in units of rows of the database, using row keys respectively specified for each of the rows (Goldstein Column 25 line 36 – Column 26 line 22);

a second encryption unit that encrypts, using a basic key, all of the row keys used by the first encryption unit (Goldstein 22 lines 49 – 17), Goldstein discloses that the codebook entries (column keys) are encrypted using a public (basic) key cryptography;

a key data generating unit that generates the column key, the row keys and the basic key (Goldstein Column 23 lines 28 – 45 and 26 lines 22), Goldstein discloses that a trusted key server (generate and administer keys) can provide authorization to exchange keys; and

a storing operation unit which stores in a memory the database after encryption by the first encryption unit and the row keys after encryption by the second encryption unit, in a mutually associated manner (Goldstein Column 22 lines 55 – 61).

18. Even though Goldstein discloses encrypting the data segment using a column key, Goldstein does not explicitly discloses encrypting the data segments forming data segment groups corresponding to column item titles of a second kind, in units of rows of data segments, using respective row keys. However, Taguchi discloses a data processing apparatus with software protecting functions capable of enhancing the level of encryption security wherein an encryption unit for encrypting the data segments of at least one data segment forming data segment groups corresponding to column item titles of a second kind, in units of rows of data segments, using respective row keys (Taguchi Column 3 line 64 – Column 4 line 15; Column 7 lines 40 – 65 and Column 11 lines 3 – 45).

19. Motivation to combine the invention of Goldstein and Taguchi comes from the need for encrypting data by using the column and row keys in a database to provide internal-level encrypted data for faster retrieval and for database information to be locally decrypted. Goldstein provides a discussion for the need for plurality of column keys to encrypt the data by using plurality of column permutations but silent on using plurality of row permutations (Goldstein Column 17 line 53 – Column 18 line 31 and Column 24 and line 34 – column 26 line 29; especially Column 26 lines 5 – 22). It would be obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings of Taguchi which discloses encrypting the data segment using the different row keys of the respective records with the teachings of Goldstein where encrypting the data segment using a column key to provide a database with internal-level data encryption using both permutations of column and row keys as the encryption keys to depend on the attributes of the row and column keys.

20. Regarding Claim 37, Goldstein teaches and describes a method for managing a database system including a first terminal unit for managing the database and a second terminal unit for searching the database independently of the first terminal unit (Goldstein Fig. 5, 6A&B; Column 10 lines 28 – 50 and Column 12 line 64 – Column 13 line 3), said method comprising;

encrypting the database by encrypting, on a first terminal side of the system:(i) data segments forming data segment groups corresponding to column item titles of a first kind using a same column key, (ii) data segments forming data segment groups

corresponding to column item titles of a second kind, in units of rows of the database, using Low keys respectively specified for each of the rows, and (iii) all of the row keys, using another key (Goldstein Column 22 lines 49 – 17 and Column 25 line 36 – Column 26 line 22), Goldstein discloses that the data is encrypted using a public (another) key cryptography;

searching the encrypted database stored on any of the distributed storage medium units, decrypting a data set obtained as a search result and displaying the decrypted data set at a second terminal unit side of the system network (Goldstein Column 14 lines 24 – 52 and Column 15 lines 1 – 4).

21. Even though Goldstein discloses encrypting the data segment using a column key, Goldstein does not explicitly discloses encrypting the data segments forming data segment groups corresponding to column item titles of a second kind, in units of rows of data segments, using respective row keys. However, Taguchi discloses a data processing apparatus with software protecting functions capable of enhancing the level of encryption security wherein an encryption unit for encrypting the data segments of at least one data segment forming data segment groups corresponding to column item titles of a second kind, in units of rows of data segments, using respective row keys (Taguchi Column 3 line 64 – Column 4 line 15; Column 7 lines 40 – 65 and Column 11 lines 3 – 45). Goldstein discloses storing the encrypted database on storage medium units for distribution (Goldstein Fig. 5, 6A&B; Column 10 lines 28 – 50 and Column 12 lines 38 – 58), Goldstein does not explicitly disclose such storage medium is a portable

storage medium unit for distribution. However, Taguchi discloses a data processing apparatus with software protecting functions capable of enhancing the level of encryption security wherein the encrypted database is stored on portable (CD) storage medium.

22. Motivation to combine the invention of Goldstein and Taguchi comes from the need for encrypting data by using the column and row keys in a database to provide internal-level encrypted data for faster retrieval and for database information to be locally decrypted. Goldstein provides a discussion for the need for plurality of column keys to encrypt the data by using plurality of column permutations but silent on using plurality of row permutations (Goldstein Column 17 line 53 – Column 18 line 31 and Column 24 and line 34 – column 26 line 29; especially Column 26 lines 5 – 22). It would be obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings of Taguchi which discloses encrypting the data segment using the different row keys of the respective records and using a CD as a portable storage medium for easy distribution with the teachings of Goldstein where encrypting the data segment using a column key to provide a database with internal-level data encryption using both permutations of column and row keys as the encryption keys to depend on the attributes of the row and column keys.

23. Regarding Claim 39, Goldstein teaches and describes a computer-readable storage medium with a program stored thereon for directing a computer to:

encrypt, in a first mode, data segments forming data segment groups corresponding to column item titles of a first kind using a same column key, said data segments being elements of a database (Goldstein Column 22 lines 49 – 17 and Column 25 line 36 – Column 26 line 22), and

encrypting all the row keys used in the second mode using another key assigned commonly for the respective rows (Goldstein Column 22 lines 49 – 17 and Column 25 line 36 – Column 26 line 22), Goldstein discloses that the data is encrypted using a public (another) key cryptography.

24. Even though Goldstein discloses encrypting the data segment using a column key, Goldstein does not explicitly discloses encrypting in a second mode, data segments forming data segment groups corresponding to column item titles of a second kind using respective row keys corresponding to respective rows of the database. However, Taguchi discloses a data processing apparatus with software protecting functions capable of enhancing the level of encryption security wherein an encryption unit for encrypting, in a second mode, data segments forming data segment groups corresponding to column item titles of a second kind using respective row keys corresponding to respective rows of the database (Taguchi Column 3 line 64 – Column 4 line 15; Column 7 lines 40 – 65 and Column 11 lines 3 – 45).

25. Motivation to combine the invention of Goldstein and Taguchi comes from the need for encrypting data by using the column and row keys in a database to provide internal-level encrypted data for faster retrieval and for database information to be locally decrypted. Goldstein provides a discussion for the need for plurality of column keys to encrypt the data by using plurality of column permutations but silent on using plurality of row permutations (Goldstein Column 17 line 53 – Column 18 line 31 and Column 24 and line 34 – column 26 line 29; especially Column 26 lines 5 – 22). It would be obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings of Taguchi which discloses encrypting the data segment using the different row keys of the respective records with the teachings of Goldstein where encrypting the data segment using a column key to provide a database with internal-level data encryption using both permutations of column and row keys as the encryption keys to depend on the attributes of the row and column keys.

26. Regarding Claim 40, Goldstein teaches and describes a database management apparatus comprising:

a database storage unit which stores a database comprising a plurality of records each record including a plurality of data segments identified by respective item titles (Goldstein Fig. 5, 6A&B; Column 10 lines 28 – 50 and Column 12 lines 38 – 58);

an item title memorizing unit. for memorizing at least one item title for specifying a corresponding at least one data segment group as a target of a data search process (Goldstein Column 12 line 64 – Column 13 line 3);

a key data memorizing unit for memorizing keys for use in encryption associated with the database, wherein the keys comprise a column key corresponding to the at least one data segment group specified by the at least one memorized item title, and a plurality of different row keys corresponding respectively to the records of the database (Goldstein Column 11 line 63 – Column 12 line 9 and Column 14 line 53 – Column 15 line 14); and

an encryption unit for encrypting: (i) the data segments of said at least one specified data segment group using the corresponding column key, and (ii) data segments of at least one data segment group corresponding to item titles other than the memorized item titles, in units corresponding to the records, using the different row keys of the respective records and another column key that is assigned commonly to the data segment groups corresponding to item titles other than the at least one memorized item title (Goldstein Column 25 line 36 – Column 26 line 22). *** and some ****

27. Even though Goldstein discloses encrypting the data segment using a column key, Goldstein does not explicitly discloses encrypting the data segment group corresponding to item titles other than the memorized item titles, in units corresponding to the records, using the different row keys of the respective records. However, Taguchi discloses a data processing apparatus with software protecting functions capable of enhancing the level of encryption security wherein an encryption unit for encrypting the data segments of at least one data segment group corresponding to item titles other than the memorized item titles, in units corresponding to the records, using the different

row keys of the respective records (Taguchi Column 3 line 64 – Column 4 line 15; Column 7 lines 40 – 65 and Column 11 lines 3 – 45).

28. Motivation to combine the invention of Goldstein and Taguchi comes from the need for encrypting data by using the column and row keys in a database to provide internal-level encrypted data for faster retrieval and for database information to be locally decrypted. Goldstein provides a discussion for the need for plurality of column keys to encrypt the data by using plurality of column permutations but silent on using plurality of row permutations (Goldstein Column 17 line 53 – Column 18 line 31 and Column 24 and line 34 – column 26 line 29; especially Column 26 lines 5 – 22). It would be obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings of Taguchi which discloses encrypting the data segment using the different row keys of the respective records with the teachings of Goldstein where encrypting the data segment using a column key to provide a database with internal-level data encryption and the encryption keys to depend on the attributes of the row and column keys.

29. Regarding Claim 41, Goldstein teaches and describes a computer program for directing a computer to execute functions comprising:

accessing a database comprising a plurality of records, each record including a plurality of data segments identified by respective item titles (Goldstein Fig. 5, 6A&B; Column 10 lines 28 – 50 and Column 12 lines 38 – 58);

memorizing at least one item title for specifying a corresponding at least one data segment group as a target of a data search process (Goldstein Column 12 line 64 – Column 13 line 3);

memorizing keys or use in encryption associated with the database, wherein the keys comprise a column key corresponding to said at least one data segment group specified by the at least one memorized item title, and a plurality of different row keys corresponding respectively to the records of the database (Goldstein Column 12 line 64 – Column 13 line 3; Column 11 line 63 – Column 12 line 9 and Column 14 line 53 – Column 15 line 14);

encrypting: (i) the data segments of said at least one specified data segment group, using the corresponding column key, and (ii) data segments of at least one data segment group corresponding to item titles other than the memorized item titles, units corresponding to the records, using the different row keys of the respective records (Goldstein Column 25 line 36 – Column 26 line 22).

30. Even though Goldstein discloses encrypting the data segment using a column key, Goldstein does not explicitly discloses encrypting the data segment group corresponding to item titles other than the memorized item titles, in units corresponding to the records, using the different row keys of the respective records. However, Taguchi discloses a data processing apparatus with software protecting functions capable of enhancing the level of encryption security wherein an encryption unit for encrypting the data segments of at least one data segment group corresponding to item titles other

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than the memorized item titles, in units corresponding to the records, using the different row keys of the respective records (Taguchi Column 3 line 64 – Column 4 line 15; Column 7 lines 40 – 65 and Column 11 lines 3 – 45).

31. Motivation to combine the invention of Goldstein and Taguchi comes from the need for encrypting data by using the column and row keys in a database to provide internal-level encrypted data for faster retrieval and for database information to be locally decrypted. Goldstein provides a discussion for the need for plurality of column keys to encrypt the data by using plurality of column permutations but silent on using plurality of row permutations (Goldstein Column 17 line 53 – Column 18 line 31 and Column 24 and line 34 – column 26 line 29; especially Column 26 lines 5 – 22). It would be obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings of Taguchi which discloses encrypting the data segment using the different row keys of the respective records with the teachings of Goldstein where encrypting the data segment using a column key to provide a database with internal-level data encryption and the encryption keys to depend on the attributes of the row and column keys.

32. Regarding Claim 42, Goldstein teaches and describes a computer program for directing a computer to execute functions comprising:

memorizing data specifying a type of encryption system to be used to encrypt data segments of each column of a database, if the column of the database is to be encrypted (Goldstein Column 12 line 64 – Column 13 line 3)

first encrypting in accordance with the data memorized by the key specification memorizing unit:

(i) data segments forming data segment groups corresponding to column item titles of a first kind using a same column key, and data segments forming data segment groups corresponding to column item titles of a second kind, in units of rows of the database? using row keys respectively specified for each of the rows (Goldstein Column 25 line 36 – Column 26 line 22);

second encrypting, with a basic key, all the row keys (Goldstein 22 lines 49 – 17), Goldstein discloses that the codebook entries (column keys) are encrypted using a public (basic) key cryptography; and

storing in a memory the database after the encryption thereof and the row keys after encryption the encryption thereof, in a mutually associated manner (Goldstein Column 22 lines 55 – 61).

33. Even though Goldstein discloses encrypting the data segment using a column key, Goldstein does not explicitly discloses encrypting the data segment group corresponding to item titles other than the memorized item titles, in units corresponding to the records, using the different row keys of the respective records. However, Taguchi discloses a data processing apparatus with software protecting functions capable of

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enhancing the level of encryption security wherein an encryption unit for encrypting the data segments of at least one data segment group corresponding to item titles other than the memorized item titles, in units corresponding to the records, using the different row keys of the respective records (Taguchi Column 3 line 64 – Column 4 line 15; Column 7 lines 40 – 65 and Column 11 lines 3 – 45).

34. Motivation to combine the invention of Goldstein and Taguchi comes from the need for encrypting data by using the column and row keys in a database to provide internal-level encrypted data for faster retrieval and for database information to be locally decrypted. Goldstein provides a discussion for the need for plurality of column keys to encrypt the data by using plurality of column permutations but silent on using plurality of row permutations (Goldstein Column 17 line 53 – Column 18 line 31 and Column 24 and line 34 – column 26 line 29; especially Column 26 lines 5 – 22). It would be obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings of Taguchi which discloses encrypting the data segment using the different row keys of the respective records with the teachings of Goldstein where encrypting the data segment using a column key to provide a database with internal-level data encryption and the encryption keys to depend on the attributes of the row and column keys.

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35. Claim 31 is rejected applied as above in rejecting Claim 30. Furthermore, Goldstein teaches and describes a database management apparatus further comprising:

a functional unit which encrypts a received data set comprising a search process condition using the corresponding column key (Goldstein Fig. 5, 6A&B; Column 10 lines 28 – 50 and Column 12 line 64 – Column 13 line 3); and

database search unit which performs the data search process by comparing the encrypted search process condition with the encrypted data segments of said at least one specified group.(Goldstein Column 14 line 53 – Column 15 line 4).

36. Claim 32 is rejected applied as above in rejecting Claim 30. Furthermore, Goldstein teaches and describes a database management apparatus, wherein the encryption unit sequentially generates vectors in a multidimensional space based on a set of predetermined functions, and the data segments are encrypted in accordance with an encryption method in which components of the sequentially generated vectors form a key stream of a key associated with the encryption method (Goldstein Column 7 line 48 – Column 8 line 67 and Column 25 lines 5 – 59), and

wherein the row keys and the column key specify constants of the functions (Goldstein Column 8 lines 60 – 66).

37. Claim 35 is rejected applied as above in rejecting Claim 34. Furthermore, Goldstein teaches and describes a database management apparatus, wherein the

row keys are each generated based on a number of the respective rows and a random number (Goldstein Column 22 lines 12 – 17 and Column 26 line 22).

38. Even though Goldstein discloses generating column key based on a column number and a random number, Goldstein does not explicitly disclose row keys are generated based on a number of the respective rows and a random number. However, Taguchi discloses a data processing apparatus with software protecting functions capable of enhancing the level of encryption security wherein row keys are generated based on a number of the respective rows and a random number (Taguchi Column 14 lines 1 – 19).

39. Motivation to combine the invention of Goldstein and Taguchi comes from the need for encrypting data by using the column and row keys in a database to provide internal-level encrypted data for faster retrieval and for database information to be locally decrypted. Goldstein provides a discussion for the need for plurality of column keys to encrypt the data by using plurality of column permutations but silent on using plurality of row permutations (Goldstein Column 17 line 53 – Column 18 line 31 and Column 24 and line 34 – column 26 line 29; especially Column 26 lines 5 – 22). It would be obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings of Taguchi which discloses generating a key with a random number and using the different row keys of the respective records with the teachings of Goldstein where encrypting the data segment using a column key to provide a database

with internal-level data encryption and the encryption keys to depend on the attributes of the row and column keys.

40. Claim 36 is rejected applied as above in rejecting Claim 34. Furthermore, Goldstein teaches and describes a database management apparatus, wherein a vector generation unit sequentially generates vectors confined to a closed subspace of an n-dimensional space and defined by functions based on the keys (Goldstein Column 7 line 48 – Column 8 line 67 and Column 25 lines 5 – 59); and

wherein a logical operation unit performs a logical operation in units of a bit involving both the data segments of the database and components of the vectors generated by the vector generation unit, to encrypt the data segments (Goldstein Column 8 lines 60 – 66).

41. Claim 38 is rejected applied as above in rejecting Claim 34. Furthermore, Goldstein teaches and describes a method for managing a database system including a first terminal unit for managing the database and a second terminal unit for searching the database independently of the first terminal unit (Goldstein Fig. 5, 6A&B; Column 10 lines 28 – 50 and Column 12 line 64 – Column 13 line 3), wherein each of the storage medium unit stores both the encrypted database generated by the first terminal unit, and a predetermined application program for performing a searching process on the encrypted database .(Goldstein Column 14 line 53 – Column 15 line 4).

Conclusion

42. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO Form 892.

43. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

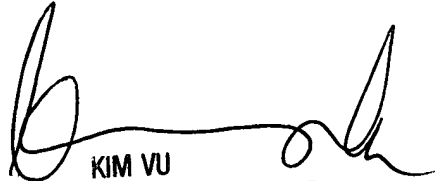
44. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pramila Parthasarathy whose telephone number is 571-272-3866. The examiner can normally be reached on 8:00a.m. To 5:00p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ayaz Sheikh can be reached on 571-232-3795.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR only. For more information about the PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Pramila Parthasarathy
February 22, 2005.


KIM VU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100